

WHAT IS CLAIMED IS:

1. A method of reducing both the amount of carbon in fly ash and the amount of NO_x resulting from the combustion of coal, the method comprising
combining coal and an additive that comprises a manganese-containing compound forming a mixture thereof; and
combusting said mixture in a combustion chamber;
the manganese-containing compound being present in an amount effective to reduce both the amount of carbon in fly ash and the amount of NO_x resulting from the combusting of the coal in the combustion chamber.
2. The method as described in claim 1, wherein the manganese compound is an organometallic compound.
3. The method as described in claim 2, wherein the organo portion of the organometallic compound is derived from a material selected from the group consisting of alcohols, aldehydes, ketones, esters, anhydrides, sulfonates, phosphonates, naphthenates, chelates, phenates, crown ethers, carboxylic acids, amides, acetyl acetonates and mixtures thereof.
4. The method described in claim 2, wherein the organometallic compound comprises methylcyclopentadienyl manganese tricarbonyl.

5. The method described in claim 2, wherein the manganese compound is selected from the following group: cyclopentadienyl manganese tricarbonyl, methylcyclopentadienyl manganese tricarbonyl, dimethylcyclopentadienyl manganese tricarbonyl, trimethylcyclopentadienyl manganese tricarbonyl, tetramethylcyclopentadienyl manganese tricarbonyl, pentamethylcyclopentadienyl manganese tricarbonyl, ethylcyclopentadienyl manganese tricarbonyl, diethylcyclopentadienyl manganese tricarbonyl, propylcyclopentadienyl manganese tricarbonyl, isopropylcyclopentadienyl manganese tricarbonyl, tert-butylcyclopentadienyl manganese tricarbonyl, octylcyclopentadienyl manganese tricarbonyl, dodecylcyclopentadienyl manganese tricarbonyl, ethylmethylcyclopentadienyl manganese tricarbonyl, indenyl manganese tricarbonyl, and the like, including mixtures of two or more such compounds.

6. The method of claim 1, wherein the manganese-containing compound is selected from the group consisting of manganese oxides, manganese sulfates, and manganese phosphates.

7. The method as described in claim 1, wherein the manganese compound comprises about 20 ppm of the coal.

8. The method as described in claim 1, wherein the manganese compound comprises about 5 to 100 ppm of the coal.

9. The method as described in claim 1, wherein the manganese compound comprises about 1 to 500 ppm of the coal.

10. The method as described in claim 1, wherein the additive is introduced into an air stream that carries the coal into the combustion chamber.

11. A method of reducing both the amount of carbon in fly ash and the amount of NO_x resulting from the combustion of coal, the method comprising
combining coal and an additive that comprises a manganese-containing compound forming a mixture thereof; and
combusting said mixture in a combustion chamber;
the manganese-containing compound being present in an amount effective to reduce both the amount of carbon in fly ash and the amount of NO_x resulting from the combusting of the coal in the combustion chamber, wherein the additive is introduced directly into the combustion chamber separately from the coal.

12. The method as described in claim 11, wherein the additive is introduced into a flue gas recirculation stream.

13. The method as described in claim 11, wherein the additive is introduced into a secondary air stream that is delivered into the combustion chamber.

14. A method of reducing both the amount of carbon in fly ash and the amount of NO_x resulting from the combustion of coal, the method comprising:

combining coal and an additive that comprises a manganese compound to form a mixture thereof;

introducing the mixture of coal and additive into a coal burning combustion chamber;

combusting the mixture in the combustion chamber; and

the manganese compound being present in an amount effective to reduce both the amount of carbon in fly ash and the amount of NO_x resulting from the combustion of the coal in the combustion chamber.

15. A coal additive for use in reducing both the amount of carbon in the fly ash and the amount of NO_x resulting from the combustion of coal, the additive comprising a manganese compound wherein the manganese compound is added to the coal prior to combustion at a treat rate of about 1 to 500 ppm of the coal.

16. The coal additive as described in claim 14, wherein the manganese compound is added to the coal prior to combustion at a treat rate of about 5 to 100 ppm of the coal.

17. The coal additive as described in claim 14, wherein the manganese compound is added to the coal prior to combustion at a treat rate of about 20 ppm of the coal.

18. A method of reducing simultaneously the amount of carbon in fly ash, the amount of NO_x, and the amount of carbon monoxide resulting from the combustion of coal, the method comprising combining coal and an additive that comprises a manganese-containing compound forming a mixture thereof; and combusting said mixture in a combustion chamber; the

manganese-containing compound being present in an amount effective to reduce the amount of carbon in fly ash, the amount of NO_x, and the amount of carbon monoxide resulting from the combusting of the coal in the combustion chamber.

19. A method of reducing both the amount of carbon monoxide and the amount of NO_x resulting from the combustion of coal, the method comprising

combining coal and an additive that comprises a manganese-containing compound forming a mixture thereof; and

combusting said mixture in a combustion chamber;

the manganese-containing compound being present in an amount effective to reduce both the amount of carbon monoxide and the amount of NO_x resulting from the combusting of the coal in the combustion chamber.

20. A method of reducing both the amount of carbon in fly ash and the amount of NO_x resulting from the combustion of coal, the method comprising combusting coal in the presence of at least 1 ppm of a manganese-containing additive, whereby the amount of carbon in fly ash and the amount of NO_x resulting from the combustion of said coal are both reduced relative to the amounts of carbon in fly ash and NO_x resulting from the combustion of coal in the absence of the manganese-containing additive.

21. A method for stabilizing coal combustion by combusting coal in the presence of at least 1 ppm of a manganese-containing additive, whereby the amount of carbon in fly ash and the amount of NO_x resulting from the combustion of said coal are both reduced relative to the

amounts of carbon in fly ash and NO_x resulting from the combustion of coal in the absence of the manganese-containing additive, and whereby combustion stability is improved relative to the combustion stability of the coal in the absence of the manganese-containing additive.